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|-------------------------------|------------------------|---------------------|--|
| Notice of Allowability | Application No. | Applicant(s) | |
| | 10/028,710 | MILLER ET AL. | |
| | Examiner | Art Unit | |
| | Thomas H Parsons | 1745 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the Amendment filed 21 January 2004.
2. ☒ The allowed claim(s) is/are 1-25.
3. ☒ The drawings filed on 28 December 2001 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- * Certified copies not received: ____.
5. ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
 - (a) ☐ The translation of the foreign language provisional application has been received.
6. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE**

7. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
8. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No. ____.
 - (b) ☐ including changes required by the proposed drawing correction filed ____, which has been approved by the Examiner.
 - (c) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No. ____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the margin according to 37 CFR 1.121(d).

9. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|---|
| 1 <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5 <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2 <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6 <input type="checkbox"/> Interview Summary (PTO-413), Paper No. ____. |
| 3 <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No. ____ | 7 <input checked="" type="checkbox"/> Examiner's Amendment /Comment |
| 4 <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material | 8 <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9 <input type="checkbox"/> Other |

Response to Amendment

This is in response to the Amendment filed 21 January 2004.

Claim Rejections - 35 USC § 102

1. The rejections of claims 1-8, 10-11, 15-16, and 18 under 35 U.S.C. 102(b) as being anticipated by Blurton et al. (4,127,462) has been **withdrawn** in view of Applicants' Amendment.

Allowable Subject Matter

1. Claims 1-25 are allowable over the prior art of record.

Reasons for Allowance

2. The following is an examiner's statement of reasons for allowance:

Burton et al. disclose a third electrode interposed between an anode and a cathode wherein the third electrode functions as a reference electrode for maintaining a fixed relative potential between the anode and the reference electrode without the development of current therebetween.

In contrast, the instantly claimed third electrode induces polarization between the anode and third electrode or between the cathode and third electrode, so as to lower activation energy of a cathode half-reaction or an anode half-reaction, and the third electrode comprises an electrically conductive metal or conducting polymer deposited thereon. These features are neither taught nor suggest by Burton et al.

Therefore, a search of the prior art of record failed to reveal or explicitly teach, alone or in combination, what is instantly claimed: in particular,

A fuel cell comprising; an anode electrode; a cathode electrode; and a third electrode interposed between the anode and the cathode electrodes, the third electrode inducing polarization between the anode electrode and the third electrode or between the cathode electrode and the third electrode, so as to lower activation energy of a cathode half-reaction or an anode half-reaction.

For this reason, and for the reasons as set forth above, claim 1 and claims 2-18 which are dependent thereon, are patentably distinct from the prior art of record.

A method of manufacturing a fuel cell, comprising: forming an anode electrode; forming a cathode electrode; forming an electrolyte material; depositing a thin film of an electrically conductive metal or conducting polymer to a reference electrode; and sandwiching the reference electrode and electrolyte material between the anode and the cathode electrodes.

For this reason, and for the reasons as set forth above, claim 19 and claims 20-21 which are dependent thereon, are patentably distinct from the prior art of record.

JP7-022047 discloses a method of controlling the amount of humidification of a gas wherein a third electrode is in direct contact with the gas phase. In contrast, the instantly claimed method is direct toward controlling hydration of a membrane wherein a third electrode is embedded within an electrolyte which is neither taught nor suggest by JP7-022047.

Therefore, a search of the prior art of record failed to reveal or explicitly teach, alone or in combination, what is instantly claimed: in particular.

A method for operating a fuel cell, comprising: applying an interactive feedback system to control the state of hydration of the ionomer membrane utilizing a third electrode other than an anode or cathode electrode, the third electrode being insulated from direct electrical contact from either the anode or the cathode by virtue of being embedded within an electrolyte.

For this reason, and for the reasons as set forth above, claim 22 and claims 23-25 which are dependent thereon are patentably distinct from the prior art of record.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas H Parsons whose telephone number is (571) 272-1290. The examiner can normally be reached on M-F (7:00-4:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thomas H Parsons
Examiner
Art Unit 1745


Patrick Ryan
Supervisory Patent Examiner
Technology Center 1700